

SECTION-III

SUPPLY OF UNIVERSAL PORTABLE ELECTRONIC REFERENCE SUB-STANDARD ENERGY METER (UNIVERSAL ERSS) CAPABLE OF TESTING OF HT THREE PHASE CT OPERATED ENERGY METERS, LT SINGLE PHASE AND THREE PHASE WHOLE CURRENT AS WELL AS CT OPERATED ENERGY METERS, AT SITE/ LABORATORY TN-2434.

3.01 GENERAL

This specification covers the general and standards requirements, technical data, design, engineering, manufacturing, assembly, inspection and testing at manufacturers' work, supply and delivery at stores of universal portable Electronic Reference Sub-Standards meter (ERSS) with complete accessories of accuracy class 0.1 for measuring in the range of 1 mA to 12 Amps in direct mode and of accuracy class 0.2S via split core transformers/ clamp-on CT (current circuits) in the range of 10 mA to 100 Amps (minimum) at site as well as in Laboratory for active, reactive and apparent energy.

3.02 REQUIREMENT

The requirement of portable LT/HT accucheck is **51 Nos.**

3.03 SCOPE

3.03.1 A portable, universal type, light-weight, electronic, precision portable energy meter testing equipment which shall be capable of testing of all types of LT single phase 2 wire, 3 phase 3 wire/ 4 wire and HT 3 phase 3 wire/ 4 wire, whole current static as well as electro mechanical and CT operated static as well as electromechanical energy meters in the range of 1 mA to 12 Amps in direct mode and via core transformers/ clamp-on CT (current circuits) in the range of 10 mA to 100 Amps (minimum) at lab as well as at site.

3.03.2 The ERSS must have micro-processor unit with software support suitable for on line testing of all types of energy meters described in clause 3.1 above at site having memory and capability of communication with the base computer/ laptop. Computer software should be such that final data be converted for further processing to generate inputs and reports.

3.03.3 The scope of the ERSS meter is not limited to following type of meters but it should be capable of:

3.03.3.1 Testing electronic meters/ electro mechanical energy meters of any latest version including but not limited to the following types:

- i. Ferraris (Induction) Meters with rotating disc.
- ii. Static Meters with flashing pulse output of LCD/LED.
- iii. Single Phase Active, Apparent and Reactive Energy Meters
- iv. Three Phase Active, Apparent and Reactive Energy Meters

v. Maximum Demand Meters, **AND**

3.03.3.2 Performing the following functions:

- i. Verification of meters circuit connections using vectorial displays.
- ii. Harmonic Analysis up to 30th harmonics i.e the harmonic along with angle for each frequency and time domain with % distortion of each frequency.

3.03.4 The ERSS meters quoted and supplied shall be completed with all parts and accessories which are useful and necessary for its efficient electrical and mechanical safe operation and as such parts are deemed to be within the scope of the supply whether specifically mentioned or not.

3.04 APPLICATION

3.04.1 Universal ERSS meters shall be suitable for use with phantom load at Meter Lab/ Site even at consumer's load and loading conditions for testing of LT single phase 2 wire, HT/LT 3 phase 3 wire or 4 wire Energy Meters static as well as E/M and shall be capable to measure the system parameters and to verify the accuracy of the energy meters in the laboratory and at site without disconnecting consumer supply in direct mode as well as when used with the clamp-on CT.

3.04.2 The Universal ERSS meters shall have feature to monitor the quality of power based on IEC-61000:4:3 standard.

3.04.3 The Universal ERSS meters shall have inbuilt memory / removable compact flash memory to store consumer information at site.

3.04.4 The Universal ERSS meters shall be able to record special attributive tests/checks like: Meter seal, Terminal Block Seal, Phase Sequence, Pulse output, Meter Display or User defined, to be performed and save for a particular installation, in addition to other mandatory tests.

3.04.5 The Universal ERSS meters shall have provision to preload consumer information for selected consumer to allocate the save database to measured results.

3.05 CLIMATIC CONDITIONS :

The equipment to be supplied against this specification should be capable of performing and maintaining the required accuracy for satisfactory continuous operation under all tropical conditions as mentioned below:

- a) Maximum ambient air temperature 60 Deg. C

b)	Minimum ambient temperature	(-) 5 Deg. C
c)	Maximum ambient air temperature in shade	50 Deg. C
d)	Average daily ambient air temperature	40 Deg. C
e)	Maximum relative humidity	95%
f)	No. of months of tropical monsoon condition	4 months
g)	Maximum altitude above sea level	1000 Meters
h)	Average rain fall	10 cms. to 100 cms.
i)	Maximum wind pressure	200 Kg/ Sq. meter.
j)	Isoceranic level (days/year)	40
k)	Seismic level (Horizontal Acceleration)	0.30 g.
l)	Permitted noise level	45 db.

3.06 STANDARDS APPLICABLE

3.06.1 Unless otherwise specified elsewhere in this specification, The ERSS meter shall conform in all respects including performance and testing of thereof to the following Indian/ International Standards to be read with up to date and latest amendments/revisions thereof:

S.No.	Standard No.	Title
1	IS: 12346/1999	Testing equipment for AC electrical energy meters.
2	IS-15707	Indian standard on testing, evaluation, installation and maintenance of ac electricity meters-code of practice.
3	IEC– 62052-11:2003	Electricity metering equipment (AC) – General requirements, tests and test conditions-Part 11-Metering Equipments.
4	IEC– 61000-4-5	Electromagnetic compatibility, Testing & Measurement techniques, Surge Immunity test.
5	IS: 9000 With latest amendments	Basic Environmental Testing Procedures for Electronic & Electrical items.
6	IS/IEC : 60529/2001	Protection against ingress of dust, moisture and

	With latest amendments	vermin.
7	IS 14697- 1999 With latest amendments	Specification for AC static transformer operated Watthour and VAR – Hour meters, class 0.5S/0.2S.
8	IEC-60687-2000 With latest amendments	AC static Watthour meters for active energy, class 0.2S
9	IEC 62053-21	Electricity metering equipment (AC)-Particular requirements-part 21, static Meters for active Energy, Class 0.5.
10	IS: 13779/1999	AC Static Watthour Meters, Class 1 and 2
11	IS: 13010/2002	AC Watthour Meters, Class 0.5, 1 and 2
12	IS: 11426 With latest amendments	Alternating Current Precision Kilowatt-hour Meters of Glass 0.5 for Testing Purposes

3.06.2 The sub standard testing meter shall also confirm to IS: 12346/ 1999 & IEC: 736/1982 with latest amendments.

3.06.3 Equipment conforming to other internationally accepted standards, which ensure equal or higher degree of quality than the standards mentioned above shall also, be acceptable. In the case of Bidders who wish to offer material conforming to the other standards salient points of difference between standards adopted and the specified standards shall be clearly brought out in the schedule of deviation. Copy of such standards with authentic English translations shall invariably be furnished along with the offer. In case of any conflict or discrepancy the order of precedence shall be (I) IS (ii) IEC (iii) other International standards, read with latest amendments. In case of any difference between the provisions of aforesaid standards and the provisions of this specification, the provisions contained in this specification shall prevail.

3.07 SYSTEM TECHNICAL DATA

The ERSS meter shall be suitable to test energy meters under the following conditions.

S.No	Particulars	For HT Application	For LT Application	
			Three Phase Meter	Single Phase Meter
1.	Supply Voltage	110 +/- 30% (phase to phase) for 3 wire and 110V/ $\sqrt{3}$ +/- 30% for 4 wire (phase to artificial	415 +/- 30% (phase to phase) for 3 phase 3 wire and 415V/ $\sqrt{3}$	240V \pm 30% (phase to neutral)

		neutral/ star point)	+/- 30% for 4 wire	
2.	Frequency	45 Hz to 55 Hz	45 Hz to 55 Hz	45 Hz to 55 Hz
3.	Power Factor range	Zero Lag -Unity - Zero Lead	Zero Lag -Unity - Zero Lead	Zero Lag -Unity - Zero Lead
4.	Working range	1 mA to 12 Amp.	10 mA to 100 A (minimum)	10 mA to 100 A (minimum)
5.	Energy Recording	Total Energy	Total Energy	Total Energy

3.08 AUXILIARY POWER SOURCE & POWER CONSUMPTION

The power consumption of the Portable Universal ERSS meter at reference voltage, frequency, temperature and rated current shall not be more than 50VA under simultaneous burden on all the phases. The apparent power consumption of the Universal ERSS meter shall not be more than 2 VA per phase in current circuit (with or without CT) and 10 VA per phase in voltage circuit. The unit can be powered either from the measuring circuit or from an auxiliary single phase supply.

3.09 DISPLAY

The Universal ERSS meter shall have high resolution LCD/ TFT display with graphical capabilities along with back lit. The size of display should be suitable for displaying the vector diagram, wave form & harmonics display and it should be clearly readable and legible. The display to be STN (Super Twisted Nematic) type construction. The parameters to be displayed should be selectable through front panel switch. The Reference Standard Meter shall display the following parameters:

- Time
- Date
- Instantaneous per phase voltage(s) for 4 wire and line voltage(s) for 3 wire.
- Instantaneous per phase line current(s).
- Total Active (Fundamental + Harmonics) Power, Reactive and Apparent Power per phase and total (derived from vectorial summation of total active power and lagging reactive power).
- Instantaneous per phase power factor in lag/ lead derived from division of total active power and apparent power of single phase.
- Instantaneous total power factor lag/ lead derived from division of total active power and apparent power.
- Instantaneous Frequency.
- Phase Sequence.
- Total Active (Fundamental + Harmonics), Reactive (for lag + lead) and Apparent three phase energies.

- Continuous update of total active, reactive (for lag + lead) and apparent energies on display.
- Harmonic Distortion per phase up to 30th harmonic.
- Total Active, Reactive and Apparent power due to each harmonics.
- Phase angle between voltages
- Phase angle between voltage and current
- Waveforms of voltage and currents of each phase
- Voltage and Current vectors
- Power Vectors
- Error in %

3.10 MEMORY

3.10.1 The Universal ERSS meters shall have the facility to store minimum 400 test results along with following instantaneous parameters-

- Instantaneous voltage & line current of each phase.
- Angel between voltage & current
- Power – Active, Reactive & Apparent per phase & total
- Voltage & Current Vectors
- Power Vector
- Power factor per phase & Total
- Total Harmonic distortion of V & I per phase
- Results of normal test / Error of MUT in percentage (results of active energy and reactive energy)
- Energy logged/ recorded by ERSS during test
- Test duration in hour, minute and seconds (with date & time of commencement of test and completion)
- Serial no. reference meter
- Serial No. of meter under test (MUT), connected CT/PT ratio
- MUT description, connected CT/PT ratio
- Meter constant of MUT
- No. revolution/ pulses for which test is being carried out

- Measuring mode/ Test configuration
- Consumer identification i.e. consumer name & address and account number
- Operator name or ID

3.10.2 The ERSS meter shall have memory to record the test date and time. The memory shall be inbuilt memory / removable compact flash memory to store consumer information at site. The data up to at least 400 tests, shall be stored in meter memory in FIFO manner (and not block method) and give flashing alarm when 90% of memory is used and these can be down loaded to computer using communication port (RS232 or USB), in of case inbuilt memory, so that print outs of test results can be taken out with compatible software. Test data stored in the memory of the reference meter shall not be lost by roll over mode but after the memory is exhausted it should flash the message on the LCD/ TFT display or it should have some other arrangement for such indication. The offered equipment shall have facility of data analysis.

3.11 DISPLAY RESOLUTIONS

The minimum resolution for various parameters shall be as follows:

1.	Voltage with resolution	0.00 Volt
2.	Current with resolution	0.000 Amp
3.	Frequency Measurement with resolution	0.00 Hz
4.	Power Factor with resolution	0.000 for all ranges
5.	Instantaneous Load (KW/ KVA/ KVAR)	0.000
6.	Energy Measurement with resolution (Wh/ VAh/ Vah)	0.000 for all ranges (minimum)
7.	Percentage Error Resolution	00.00
8.	Polarity/ connection of system	Indication of correct/ error
9.	Indication of utilization of the memory	To be provided

3.12 ACCURACY REQUIREMENT

The accuracy class of the Universal ERSS meters shall be **0.1 in direct mode** and **0.2s with clamp on CT** for HT/ LT consumers under all conditions of testing at

site/ lab with either in direct mode or with clamp on CT mode. The accuracy of the universal ERSS shall be sufficient in any condition for testing KWh, KVAh and KVAh parts of the energy meters of class 1.0 conforming to IS:13779, IS:13010 or IEC:61036, in case of LT meters and the energy meters of class 0.5s conforming to IS:14697 or IEC:60687 for HT meters.

3.13 MEASUREMENT MODE

The Universal ERSS shall have the following measurement mode to test LT & HT CT operated meters and direct connected (whole current) type meters.

(a) Direct Mode :

The provision shall be made for testing of HT & LT CT operated energy meters using phantom load at meter testing lab as well as at site without use of clamp on CTs i.e. with direct mode in 1 mA to 12 Amp. Range confirming to class 0.1.

(b) Clamp-On (Split core current transformers) Mode :

Three clamp-on type split core error compensated current transformers (CTs) for 10 mA to 100 Amps. Confirming to class 0.2s shall be provided along with equipment to test direct connected whole current energy meters without disconnecting them from the circuit.

Additional clamp on error compensated CTs to measure primary current 50Amp. to 400 Amps. Capacity conforming to accuracy class not more than 0.5s suitable shall be supplied as per the requirement.

The maximum clamping capacity of Clamp On CT shall be at least 52 mm.

The measuring mode i.e. (a) & (b) above shall be selectable by using keyboard provide on the equipment.

The CTs should not saturate upto 150% of the highest rated current i.e. if 150% of highest rated current is applied for 30 minutes. The Universal ERSS meter should not get damaged & after restoration of the normal conditions, it should continue to measure correctly within respective accuracy class.

3.14 OPERATING MODE

a) Manual Mode :

The equipment shall have facilities to test in manual mode using snap switch along with detachable lead as well as inbuilt snap switch to start and stop the test.

b) Auto Mode :

A scanner shall be provide along with the equipment to test electromechanical meters by sensing the rotor mark and static (electronic) meters by sensing the LED/ LCD pulses. **The scanner shall be provide with preferably vacuum type fixing arrangement or any other arrangement suitable to test the meter in laboratory as well as at site.** Scanner should be able to read correctly even in case of its alignment is deviating upto on angle of 15 Deg. of the axes of optical port.

3.15 CONSTRUCTIONAL FEATURES AND GENERAL REQUIREMENTS

- 3.15.1 Alpha- Numeric key board for entering consumer particulars, meter make and serial number, meter constant, test revolutions or pulses and operating the equipment software program.
- 3.15.2 Scanner/Optical sensor head along with detachable lead to be used to count revolutions of the disc in Ferraris wheel meters and LED pulses in static meters as well as for LCD pulses in static meters (optional).
- 3.15.3 Snap switch along with detachable lead to be used as an alternative to scanner/sensor head.
- 3.15.4 Articulating sensor head clamp to hold the scanner properly in front of the LED/ LCD output or revolving disc.
- 3.15.5 Electronic compensated clamp-on CTs which enable the testing without isolating or interrupting the supply of the consumer. The equipment shall have facility to interchange the clamp on CT without affecting the accuracy.
- 3.15.6 Voltage leads with connector stricks/ any other suitable clamping arrangement with insulated leas.
- 3.15.7 Indication LED/ LCD on screen to indicate that ERSS is in correct active mode.
- 3.15.8 Display of vector diagram for analysis of mains conditions and meter connections.
- 3.15.9 Universal ERSS meters shall be capable of indication display for the following conditions.
- Missing Potential.
 - Missing Current.
 - Reverse current if any current is reverse.
 - Phase sequence if forward or reverse.
 - Over Current.
 - Over Voltage.
 - Wiring/ correct association of voltage and current.
 - Detection of circuit connection faults.
- 3.15.10 The universal ERSS meter shall have two outputs-
- A test output in the form of frequency on BNC socket/ blinking LED for its own calibration.
 - Facility shall be provided to switch on & off the source for carrying out the dial test.

- 3.15.11 Self diagnostic feature LCD/ LED test is required to be provided on ERSS meter's display to indicate the healthiness of all segments of LCD/LED display.
- 3.15.12 The universal ERSS shall have facility to power up from both measuring circuit and auxiliary single phase supply of the range from 55 V to 260 V, 47 to 63 Hz.
- 3.15.13 The unit shall have provision of battery backup for data storage and it shall be made functional on giving supply of 240 volts AC between phase to neutral for down loading the data to PC/ Laptop.
- 3.15.14 The ERSS meter shall have suitable provision to prevent stopping of meter by using external magnets i.e. shall not be adversely affected by influence of external magnetic field. The meter shall comply requirement specified in CBIP publication-304.
- 3.15.15 The ERSS meter shall measure and display a comprehensive analysis of three phase system showing instantaneous and integrated values of
- True RMS value for each voltage and current inputs.
 - Measurement of 30th harmonics with display of effective active, reactive and apparent power due to each harmonic.
- 3.15.16 It should be possible to input external CT and PT ratios, i.e. measured parameters will be then shown as primary values.
- 3.15.17 The choice for following visual display to give a graphical analysis of the system under test shall be provide-
- Vectorial display of system parameters.
 - Waveform display of voltage & current.
 - Frequency spectrum display in Lin, Log or relation mode.
- 3.15.18 Auto range of current and voltage inputs shall be provided. (Optional and shall be preferable if there is no price difference while evaluating the offer).
- 3.15.19 The ERSS meter shall display the error(s) if the meter under test automatically.
- 3.15.20 The ERSS meter shall have facility of a built in interface to an external printer.
- 3.15.21 The ERSS meter shall be packed in an ergonomically and aesthetically designed instrument case which can withstand the usual handling of field personnel and normal transportation.
- 3.15.22 All the cords/ connectors/ accessories supplied along with the instruments must conform to IEC-1010 and the international standards of safety. Adequate built in features to protect the instrument itself from overvoltage shall be provided.
- 3.15.23 The ERSS meter shall have ASCII or similar support i.e. provision for converting data into ASCII or other popular and commonly available computer software programs such that the data can be integrated with the meter management system of the utility for ensuring error test record an periodical meter testing.
- 3.15.24 Latest state of art technology for obtaining sustained accuracy, flawless, long lasting service. It should be rugged enough to undergo handling in field conditions while being carried from place to place. It should therefore be convenient to carry and immune to vibrations or shocks due to

transportation or handling. It should also be immune to external electrical and magnetic fields.

3.15.25 The ERSS meter should also ensure:

- Personal safety against electrical shock.
- Personal safety against effect of excessive temperature.
- Protection against spreading of fire.
- Protection against fraud etc.
- All parts vulnerable to corrosion should be given protective coating, which should not be liable to damage or lost due to normal handling.
- Should be low weight compact and of small size.
- Protection against penetration of solid objects dust and water (degree of protection shall be IP-40).

3.15.26 The ERSS meter should have back space facility.

3.15.27 Facility to test on line LT-CTs for CT ratio and phase error measurement. Facility to test PT ratio & phase error of 33 KV and 11 KV combined CT-PT sets. The ERSS shall also perform burden measurements of installed CT/ PT at running load of the consumer (the prices of equipments/ features may be quoted separately).

3.16 NAME PLATE DATA AND MARKING

The equipment will exhibit the Nameplate (Metallic) at the appropriate place. Words "JVNL", Serial Number of the equipment along with date of manufacturing as well as other technical details shall invariably be mentioned on the equipment as well as on the hand bag.

3.17 SOFTWARE

3.17.1 Each Universal ERSS meter shall be supplied along with Base Computer Software. The software shall be suitable for downloading the test result into compatible PC/ Laptop using serial interface data transfer (USB port / RS232 port, USB port will be preferred). Alternatively the equipment shall be compatible to printer. The software shall have facility to generate the test report for individual testing and summary report of all test reports.

3.17.2 The software shall have the facility to upload customer information, site information and special attributive tests information into the memory of the ERSS from its database.

3.17.3 The offered software shall have facility to convert all stored test results in ASCII file format or similar non-editable format as required.

3.17.4 The offered software shall be user friendly & menu driven. The supplier shall impart necessary training regarding installation and use of the above software.

3.18 ACCESSORIES

Each Universal ERSS meter shall be supplied along with following accessories:

- 3.18.1 One common optical sensor (scanning head) for automatic testing, which can be used to sense disc revolutions in electromechanical meters as well as indicating LED's/ LCD's in static meters including clamp on devise and connection cable and scanning head carriage.
- 3.18.2 Mounting arrangement (clamp) for the optical sensor.
- 3.18.3 One set of 3 piece error compensated Clamp on CTs for on-line testing.
- 3.18.4 One set of voltage leads (4 nos.) with insulated clips.
- 3.18.5 One set of Current leads (6 nos.) to connect the equipment in direct mode.
- 3.18.6 Communication cord with USB/ RS232 connector to retrieve stored data from the equipment and download the same to a PC/ Laptop.
- 3.18.7 Snap switch along with detachable laed as well as in built snap switch.
- 3.18.8 Operating manual in English.
- 3.18.9 One adopter set with omega clip.
- 3.18.10 One head switch.
- 3.18.11 One mains cable.
- 3.18.12 One standard calibration report.
- 3.18.13 Data down load software to read out the module for transfer and presentation of data.
- 3.18.14 One set of 3 piece error compensated clamp on CTs for measurement of current up to 400 Amp, complete with connection cable.
- 3.18.15 Cable for self calibration along with BNC terminal on both sides.
- 3.18.16 A set of clips/ connectors as following:
- Cable adopter/ connection pins 10 Nos.
 - Voltage adopters 04 Nos.
 - Banana clips (straight) 06 Nos.
 - Banana Clips (bended) 04 Nos.
 - Crocodile Clips 04 Nos.
 - U clips 06 Nos.
- 3.18.17 Any other accessories which may be required for complete and successful utilization of the equipment as per this specification shall be supplied.

3.19 INTERFACE

The Universal ERSS meter shall have following interface provisions:

- Scanner which can sense a blinking pulses / rotor mark.
- USB/ RS 232 port for downloading test result in PC/ Laptop.
- High resolution electrical pulse output to allow testing of this universal ERSS against reference standard of higher accuracy.
- Data storage on removable compact flash memory card or by any suitable means.
- Facility to perform dial test in auto mode.
- Provision to print test result on Portable printer (optional).

Note: The optical scanner head should be capable to evaluate the error through calibrating pulses output of electronic meter & red/ black mark on the rotor disc of electromechanical meter.

3.20 CIRCUIT PROTECTION

Adequate protection fuses should be provided in the unit for current circuit(s).

3.21 SHOCK AND VIBRATION PROTECTION :

The equipment must be immune to impact of vibration and dumping due to transport. It shall be within the limit specified in IS:14697 or IEC:60687.

3.22 ELECTROMAGNETIC COMPATIBILITY AND INTERFERENCE REQUIREMENT

3.22.1 The Universal ERSS meter will be required to work in the field where Stray Electromagnetic Disturbances or Electro Static Discharges may influence the ERSS. Similarly, the field generated by the ERSS may influence the meter under test. The composition of the ERSS should, therefore, be such that it's functioning is immune to these forces of external origin and it does not create electromagnetic field, which affects the working or the meteorological functioning of the meter under test.

3.22.2 The equipment shall be fully protected against electromagnetic interference introduced through the connection cable, through capacitive or inductive coupling or by radiated electromagnetic interference. The Universal ERSS meter shall meet EMI / EMC requirements as specified in the relevant standards described in clause 6.0 of this specification.

3.22.3 The ERSS may be subjected to "Influence Quantity Tests" in this regard according to relevant clauses of IS:14697 or IEC:61000-4-4.

3.22.4 The ERSS may be subjected to electromagnetic field of the external origin up to the limit specified in CBIP publication-304. It should be immune to its influence conforming to IEC 802-3

3.22.5 The ERSS may be subjected to electrostatic discharges up to 10 Nos. and voltage up to 10 KV level. It should not affect the working or the meteorological function of the ERSS conforming IEC 801-4.

3.22.6 Magnetic field produced by ERSS-

The ERSS should not produce any electromagnetic field which may affect working of meter under test conforming to the IEC and IS.

3.22.7 Radio Interference Measurement-

It should not produce any conducted or radiated noise, which can interfere with other equipments and meter under test.

3.23 DIELECTRIC STRENGTH :

The equipment shall be capable to withstand between circuits and, between circuits & case 2 KV/ 4 KV AC 50 Hz for one minute time.

3.24 TYPE TEST REPORT :

The bidder shall have to submit type test report of Universal ERSS meter as per IEC-607361/ IS:1246/ any other relevant standard. The offer without type test report shall not be considered for further evaluation. Also the type test shall not be older than **5 years** from the date of advertisement of the tender.

3.25 TEST AND FACILITIES

The bidder shall provide at his cost, facilities to carry out the following tests on the ERSS meters-

3.25.1 Test of insulation properties:

- (i) AC High voltage test.
- (ii) Insulation test.

3.25.2 Test of accuracy requirement :

- (i) Tests on limits of error.
- (ii) Test of reference meter constant.
- (iii) Test of minimum starting current.
- (iv) Test on no load condition.
- (v) Test of repeatability of error.

3.25.3 Test of electrical requirement :

- (i) Test for power consumption.
- (ii) Test of influence of supply voltage.

3.25.4 Test of mechanical requirements :

- (i) Vibration test.
- (ii) Shock test.
- (iii) Spring hammer test.
- (iv) Protection against penetration of dust and water (IP-40).

3.25.5 Other Test :

- (i) Test of operation of snap switch.
- (ii) Verification of ERSS meter data storage and BCS features.
- (iii) Test of operation of optical scanner.

3.26 TEST CERTIFICATE :

Routine test report, calibration certificate & operation manual is to be provided along with each meter. The routine test certificate of the equipment shall be provided along with each equipment and it will be in form of Compact Disc.

3.27 CALIBRATION CERTIFICATE OF ERSS :

The universal ERSS should be supplied along with the calibration certificate as per relevant standards and shall be issued by National/ International Recognized Laboratories.

3.28 SAMPLE :

The bidder shall furnish one sample of reference meter conforming to this specification duly sealed along with routine test certificates, operating manual and computer software along with necessary accessories in the office of SE(MM-II),JVNL, Jaipur one day prior to the date of opening of Tender. If the samples are not received, the bid shall be considered as Non-responsive. This sample shall be tested by the M&P Wing of Nigam as per specification in presence of firm's representative. If samples do not conform to our specification, the offer shall be considered as Non-Responsive and price bid of such bidder shall not be opened. The sample will be returned after finalization of the tender.

3.29 INSPECTION :

The successful bidder shall offer universal ERSS meters at their works for inspection by authorized inspecting officer(s)/ agency of the Nigam, before dispatch. The offered lot shall be tested for acceptance test and any other test as per relevant IEC/ IS as required by authorized inspecting officer(s)/ agency of the Nigam.

3.30 PREFERENCE :

Only the original manufacture or their authorized dealers in India (in case ERSS meter is imported) of the meters shall quote against this tender enquiry.

3.31 AUTHORIZATION CERTIFICATE:

Authorization letter from the original manufacturers confirming that you are the authorized dealer/ distributor in the region and you are authorized to quote on their behalf should be furnished with the offer. In case of offering an imported brand a letter from the manufacturers confirming that you are their authorized representative in the country and you are authorized to quote on their behalf is essentially required with the offer.

3.32 TRAINING :

The successful bidder shall depute their representative to educate Engineers of JVNL as and when they will be called for, at no extra cost.

3.33 MAINTENANCE AND GUARANTEE:

It shall be governed by relevant clauses of GCC except that the guarantee shall be for a period of 5 years from the date of supply. The equipment found defective within the above guarantee period shall be repaired /replaced by the supplier free of cost within one month of receipt of intimation.

3.34 AFTER SALE SERVICE :

The bidder has to indicate clearly what type after sales service shall be provided within guarantee period and outside guarantee period and address of sales service centre, details of engineers shall be submitted with offer.

3.35 CASE AND WINDOW :

The Universal ERSS Meter should be housed in a suitable engineering plastic or metal case and any non-permanent deformation of the case shall not affect the satisfactory performance of the equipment. The window shall be made of transparent material.

3.36 CARRYING CASE:

Each Universal ERSS Meter shall be supplied in an Aluminum carrying case suitable for easy portability, rugged use and to prevent damage during transit. The Universal ERSS Meter should be immune to vibrations and shocks in normal transportation and handling.

3.37 PACKING AND FORWARDING :

The packing of the equipment shall be such that it should not get damaged during transit. Each test set shall be supplied with suitable packing for easy transportation, rugged use and to prevent damage during transit in addition to packing as per relevant clause of GCC. The supplied equipments should be immune to vibrations and shocks in normal transportation and handling.

3.38 COMPLETENESS OF EQUIPMENT :

Any fittings accessories or apparatus, which may not have been specifically mentioned in the specification, shall be deemed to be included and shall be supplied by the supplier without any extra charges. The equipment shall be a complete unit in all respect whether such details are mentioned in this specification or not.

3.39 GUARANTEED TECHNICAL PARTICULARS :

A statement of guaranteed technical particulars shall be furnished in the format attached as per Annex.-I along with the bid without which the Bid shall be treated as Non-Responsive.

3.40 PRICES:

The bidder must quote prices on "FIRM" price basis inclusive of all applicable taxes & duties with complete break up of unit FOR price of individual

equipment included in this specifications. The prices shall be quoted item wise as per details of items and their standard accessories necessarily for all items of this specifications failing which tender offer may be rejected.

3.41 DELIVERY SCHEDULE:

The commencement period for supply shall be 30 days from the date of receipt of PO and supply shall be completed within **one month** thereafter.

3.42 ADDITIONAL ORDER

Repeat orders for additional quantities, upto 50% of original ordered quantities, may be placed by the Nigam, on the same rates, terms and conditions given in the contract.
